Before the

FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz	)	GN Docket No. 17-183
	)	
	)	
To: The Commission	)	

COMMENTS OF NOVELDA US, INC

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I. INTRODUCTION

Novelda respectfully submits this response to the FCC ("the Commission") in the above-mentioned proceeding. Novelda is a developer and supplier of Impulse-Radio Ultra-Wideband (IR-UWB) semiconductor devices and sensor modules designed to operate in the bands in question, and we appreciate the opportunity to provide these comments to the Commission.

II. COMMENTARY

We recognize that this Notice of Inquiry has been prompted, in a large part, as a result of Wi-Fi equipment manufacturers seeking more spectrum to offer additional service to their users and grow their business. Neither these manufacturers nor the Notice of Inquiry itself have given consideration to the fact that the bands between 3 GHz and 10 GHz are already available for unlicensed usage under FCC PART 15 Subpart C Section 15.250 *Operation of wideband systems within the band 5925-7250 MHz* , and/or under Subpart F – *Ultra-Wideband Operation*, and that there are already many manufactures making and deploying equipment operating under these wideband and ultra-wideband rules.

Novelda is a manufacturer of radar semiconductor devices and OEM-modules designed to be operated in these bands, and which our customers use to design, manufacture, and deploy such equipment. As such then, we are very concerned that these existing and rapidly expanding deployments will be severely disrupted if new higher-powered unlicensed transmitters are allowed to occupy the spectrum that is now being effectively used by UWB and wideband radios for a variety of useful and critical applications. Novelda is currently supplying devices to a variety of applications, with the largest growth within the areas of health / lifestyle, elderly care, building automation / security, and man-machine interfaces where advanced high-precision sensing is utilized to increase quality-of-life and preserve energy.

These and other applications are enabled by UWB radar technology utilizing the currently available bandwidth to enable high spatial resolution and sensitivity even with the very limited allowed transmit level of -41.3 dBm/MHz. Many new products enabled by this technology are currently under development:

- Monitoring of elderly people and infants in a hospital / care unit / home setting
- Monitoring of drivers or operators of vehicles to avoid drowsiness or falling asleep
- Counting and localization of people in buildings or meeting rooms to optimize HVAC and save energy
- Robust detection of presence in office buildings, hotels etc. to increase safety and enable more efficient evacuation in case of fire, earthquakes etc.

- Non-contact monitoring of vital signs
- In-car presence sensing to avoid leaving infants or pets in overheated parked cars
- Presence detection and gesticulation control for consumer electronics user-interfaces
- Fully automated and remote sleep monitoring
- Non-invasive monitoring of cardiovascular diseases
- Non-destructive material inspection

III. BAND 3.7-4.2 GHz

This band is one of the bands supported by Novelda's semiconductor devices and is particularly well suited for on-body non-invasive monitoring of vital signs or material inspection due to the combination of relatively low frequency and high bandwidth. Equipment using this band may operate under FCC PART 15 Subpart F indoors and outdoors handheld equipment. Devices operating here will experience less path-loss which makes it suitable for use in challenging environments or where penetration into or through objects is required.

IV. BAND 5.925-7.125 GHz

This band is the main band used by Novelda's semiconductor devices and modules where we have a center frequency of 7.25 GHz and a nominal 3dB bandwidth of up to 1.5 GHz. In general, this band is especially useful since equipment here may operate under the wideband rules of FCC PART 15 Subpart C Section 15.250, allowing outdoor usage on mobile devices (as well as general indoor usage). This band is also well harmonized with European UWB standards and is therefore the preferred choice for high-volume applications where path-loss is not a concern due to its large regulatory footprint. The high bandwidth also enables high-resolution and high precision sensing which is of vital importance for several applications.

V. POTENTIAL NEW ENTRANTS

Opening up the bands identified in II and III above, particularly the 5.925-7.125 GHz band, to new unlicensed transmitters with U-NII like power levels should be of concern to the Commission from the point of view of the likely disruption to the unlicensed equipment the Commission has already allowed to operate under FCC PART 15 Subpart C Section 15.250, and/or Subpart F, particularly in light of their application in areas of safety and security whose impairment could have serious consequences.

Ideally, to avoid this disruption, any new entrants would be constrained to the transmit power limits currently allowed by these wideband and ultra-wideband rules. Detect-and-avoid of the deployed devices will be difficult since their maximum transmit level of -41.3 dBm/MHz will in general make

them undetectable by typical U-NII radios unless they include specific demodulators for the deployed wideband modulations.

VI. URGENCY

While the coalitions of companies seeking the opening of the aforementioned bands are saying this is an urgent matter, we would ask the Commission to proceed with caution taking due consideration of the current unlicensed users and applications who should be protected. A number of the coalition companies, whether their Wi-Fi lobby know it or not, are also active in pursing product designs and solutions using IR-UWB for different sensor applications.

VII. CONCLUSIONS

With regards to the general questions in the NOI, we were disappointed that the current unlicensed use of the frequency range between 3.1 and 10.6 GHz appears to have been overlooked by the Commission and the supporting companies.

We believe that the 3.7-4.2 GHz band and most particularly the 5.925 to 7.125 GHz band should not be opened to U-NII usage because of the likely disruption these new transmitters will cause to existing deployed equipment and systems operating unlicensed under FCC PART 15 Subpart C Section 15.250, and/or under Subpart F. Or, any new unlicensed users allowed should also be subject to the -41.3 dBm/MHz power limit. There are thousands of companies who have invested and are investing billions of dollars in the development of UWB and wideband systems. This industry represents substantial employment and revenue generation, both of which are growing rapidly. The utility of these systems, for precision location based services often in security and safety critical applications, must be preserved.

Yours respectfully,

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